Introduction to Tree Identification

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How To Be Good at Tree ID

• Read and study, build a library
• Observe trees, tree parts
• Learn terminology
• Visit arboreta, botanical gardens, nurseries
• Key out a lot of trees at first
How To Be Good at Tree ID

• Learn genera, species will come later
• Learn families for common traits
• Learn what is found in your area
• Learn tree/forest ecology
• Enjoy doing it
Keying

- Process of sorting, narrowing down choices
- First choices easy, later difficult
- Leaves, twigs (pith), buds, flowers, fruit, bark
- Usually either/or (dichotomous)
  - Broad leaved/scaly or needle
  - Opposite/alternate (or whorled)
  - Simple/compound (or both)
- Ideal key has all local flora, no non-local flora
- Teaches observation, terminology
Utah Tree Keys & ID Info

- Guide to the Trees of Utah and the Intermountain West, Kuhns – native and most introduced
- USU Extension Forestry Web Resources – [extension. usu.edu/forestry/UtahForests/UF_UtahTrees.htm](http://extension.usu.edu/forestry/UtahForests/UF_UtahTrees.htm)
- USU Tree Browser – [www.treebrowser.org](http://www.treebrowser.org)
- Trees of Utah, Brough & Weber – Utah natives
- Vascular Plants of Northern Utah, Shaw – native & many introduced
- A Utah Flora, Welsh et al. – native & many introduced; no illustrations
Keying Criteria

- Leaf – Type, arrangement, composition, shape, margin, tip, base, surfaces
- Twig – Pith, buds, leaf scars, lenticels
- Flowers, fruit
- Bark – Young and old
- Others
Leaf Type

Broad Simple

Broad Compound

Scale-like

Awl-like

Needle-like
Leaf Arrangement (On Stem)

- Opposite
- Whorled
- Subopposite
- Alternate
Leaf Composition

- Even Pinnately Compound
- Bipinnately Compound
- Odd Pinnately Compound
- Simple (Lobed)
- Palmately Compound
- Petiolule Rachilla
Leaf Shape

- Ovate
- Lanceolate
- Cordate
- Elliptical
- Spatulate
- Obovate
- Oblanceolate
- Obcordate
- Oblong
- Linear
- Peltate
- Cuneate
- Reniform
- Hastate
Leaf Margins

- Undulate
- Serrate
- Lobed
- Entire
- Doubly-Serrate
- Serrulate
- Crenate
- Sinuate
- Dentate
- Incised
Leaf Tips

Acuminate

Obtuse

Acute

Truncate

Cuspidate

Obcordate

Emarginate

Mucronate
Leaf Bases

- Cuneate
- Acute
- Auriculate
- Rounded
- Cordate
- Sagittate
- Hastate
- Oblique
- Truncate
Twig & Pith

- Terminal Bud
- Leaf Scar
- Lateral Bud
- Lenticel
- Bud Scale
- Vascular Bundle Trace
- Terminal Bud Scale Scar
- Pith

- Uniform Pith
- Chambered Pith
- Hollow Pith
- Excavated Pith
Trees of Northern Utah Mountains

- To use this key, click on the image that best fits the description of the tree you are trying to identify. Although this is generally a dichotomous key, you will occasionally have three choices. Throughout the key the most important diagnostic characteristics are seen in red. When the key brings you to a species, click on the final image for a photo and more information about the tree you have identified.
- Start by clicking on the image that represents the leaf type of the tree you are keying out.

Does the tree have leaves that are needle-like, and are usually evergreen? Does the tree have leaves that are small, scale-like or awl-shaped, and hug the twig, and fruit that is berry-like, often with a whitish, waxy covering? These are junipers.

Does the tree have leaves that are broad and thin, and are deciduous (do not stay green or stay on the tree overwinter) or evergreen?
You have selected a needle-like leaf type. Click on the image that best represents the needles of your sample.

Are the needles arranged in clusters of 2 to 5 and evergreen? These are pines.

Are the needles arranged singly and evergreen, the fruit a woody or papery cone of scales with seed?
You have selected needle like leaves in clusters of 2 to 5. Click on the image that best represents the number of needles of your sample.

Are the needles clustered in 2's and/or 3's, and the cone scales thick and with or without prickles?

Are the needles mainly clustered in 5's, and the cones 3'' to 10'' long, the scales without prickles? Clue: the young branches are very flexible. Yes?

It is a limber pine (Pinus flexilis). Click on the image below to find out more about this species.
You have selected needle like leaves in clusters of 2 or 3. Click on the image below to find out more about the species you have keyed out.

Are the needles mainly clustered in 2's, 1" to 3" long; with the cones unsymmetrical, often remaining closed and attached to the tree for many years, the scales armed with a sharp spine? Yes?

It is a **lodgepole pine** (*Pinus contorta*).

Are the needles clustered in 2's and 3's on the same tree, 4" to 7" long, and the tree is found throughout the West? Clue: these are not native in Logan Canyon, but there is a planting at the Tony Grove turn-off. These also are native to mountainous areas in much of the rest of Utah. Yes?

It is a **ponderosa pine** (*Pinus ponderosa*).
Tree ID Tips

- Winter ID – missing parts
- Use what works for you – odor, taste, hunch
- Don’t look at just one of anything
- Google – “keying” & using Latin names
- Prioritize
  - Maybe focus first on conifers. Then opposite leaves; alternate, compound leaves; alternate, simple, entire leaves; & alternate, simple, lobed leaves
  - Learn alternate, simple, toothed leaves last
Conifers

- Pinaceae – needles, woody or papery cones
- Cupressaceae – scaly or awl-shaped foliage
- Ginkgoaceae – broadleaved conifer
- Taxodiaceae – 2 genera are deciduous
- Taxaceae – shrubs in Utah

See USU Conifers for Utah fact sheet (click here)
Utah Conifers - Pinaceae

- *Pinus* – needles in fascicles, woody cones
- *Abies* – flat, non-prickly needles; upright, deciduous cone scales (*flat, friendly, flexible firs*)
- *Picea* – prickly, 4-sided needles; papery cones
- *Pseudotsuga menziesii* – cones w/ mouse-tail bracts
- *Cedrus* – large, upright cones; needles single and in whorls
- *Larix* – needles as w/ *Cedrus*, but deciduous; small, upright cones
*Pinus longaeva* 
*Pinus aristata* 5’s

*Pinus flexilis* 5’s
Pinus sylvestris 2’s

Pinus edulis 2’s

Pinus monophylla 1’s
Abies lasiocarpa

Abies concolor
Spruces

Picea engelmannii

Picea pungens
Spruces

*Picea abies* v. ‘Pendula’

*Picea glauca* v. ‘Densata’

v. ‘Conica’

v. ‘Pumila’
Douglas-fir

*Pseudotsuga menziesii*

v. ‘Glauc’
Larches

Larix kaempferi

v. ‘Pendula’

Larix decidua
Conifers - Cupressaceae

- **Cupressus** – scaly or awl-like foliage, woody cones
- **Juniperus** – scaly or awl-like foliage, “berry” cones
- **Thuja** – scaly foliage, flattened sprays; small cones
- **Calocedrus** – scaly foliage, flattened; duck-bill cones
- **Chamaecyparis** – scaly foliage, small cones
- **X Cupressocyparis** – bluish foliage
Conifers - Ginkgoaceae

- *Ginkgo biloba* – very distinctive leaves, broadleaves, spur shoots
Conifers - Taxodiaceae

- *Taxodium distichum* – needles deciduous; round, woody cone
- *Sequoiadendron giganteum* – scaly or awl shaped foliage, distinctive cones
- *Metasequoia glyptostroboides* – needles deciduous; distinctive cones
Conifers – Taxaceae

- *Taxus* – flat needles; distinctive fruit (aril); mostly shrubs
Opposite Leaves

- MADCap Horse
  - Maple
  - Ash
  - Dogwood
  - Caprifoliaceae
  - Horsechestnut

- Alternate leaves = alternate branches
  Opposite leaves ≈ opposite branches
Maple (Acer, Aceraceae)

- Opposite, simple and/or **compound**, palmately lobed, double samaras
- Primary – canyon*, boxelder*, Rocky Mtn.*+, Norway+, silver
- Secondary – sycamore, hedge, red, sugar, Amur, Freeman hybrids, Japanese
- Rare – **paperbark**, black, Tatarian, trident, purpleblow

*Utah Native

+Utah Naturalized
Acer glabrum

Acer griseum

Acer saccharinum

Acer tataricum

Acer grandidentatum
Ash (*Fraxinus*, Oleaceae)

- Opposite, compound (1 is simple), single samaras
- Primary – green+, white, singleleaf*
- Secondary – European, velvet*

*Utah Native + Utah Naturalized
Fraxinus americana v. ‘Autumn Purple’

Fraxinus excelsior

Fraxinus anomala
Dogwood (*Cornus*, Cornaceae)

- Opposite, simple, entire, drupes
- Primary – red-stemmed* (shrub)
- Secondary – flowering, Kousa
- Rare – pagoda, corneliancherry

*Utah Native*
Cornus kousa
Cornus florida 'Rubra'
Cornus sericea
Caprifoliaceae

- Opposite, simple or compound
- Primary – blue elder* (shrub to tree)
- Others – many shrubs & vines, including honeysuckles, viburnums, snowberry

*Utah Native
Sambucus cerulea
Horsechestnut (Aesculus, Hippocastanaceae)

- Opposite, palmately compound, serrate, capsule
- Primary – horsechestnut
- Secondary – red buckeye, Ohio buckeye
- Rare – California, yellow
Other Opposite & Whorled Leaves

- *Phellodendron amurense*, Amur corktree
- *Cercidiphyllum japonicum*, katsuratree
- *Lagerstroemia indica*, crapemyrtle
- Bignoniaceae
- *Syringa reticulata*, Japanese tree lilac
- *Chionanthus virginicus*, fringetree
Lagerstroemia indica

Catalpa speciosa (Bignoniaceae)
Alternate, Compound Leaves

- Fabaceae (except *Cercis*)
- Juglandaceae
- *Sorbus* – mountain-ash (one is simple)
- *Koelreuteria paniculata* – goldenraintree
- *Melia azederach* – Chinaberry
- *Ptelea angustifolia* – common hoptree
- *Ailanthus altissima* – tree-of-heaven
- *Pistacia chinensis* – Chinese pistache
Alternate, Simple, Entire (unlobed) Leaves

- Elaeagnus angustifolia – Russian-olive
- Cercis – redbuds
- Maclura pomifera – Osage-orange
- Quercus imbricaria – shingle oak
- Fagus sylvatica – European beech
- Celtis reticulata – netleaf hackberry
- Cotinus – smoketrees
- Magnolia – magnolias
- Cercocarpus ledifolius – curlleaf mtn.-mahogany
Alternate, Simple, Lobed Leaves

- *Quercus* – Many species
- *Morus* – Some leaves lobed
- *Platanus*
- *Populus alba* – Some leaves
- *Liriodendron tulipifera*
- *Malus* – Some species, cultivars
- *Crataegus* – Some species
Alternate, Simple, Toothed (Unlobed) Leaves

- **Salicaeae** – *Salix*, most *Populus*
- **Betulaceae** – *Betula*, *Alnus*, *Carpinus*, etc.
- **Fagaceae** – *Fagus grandifolia*, *Castanea*, some *Quercus*
- **Rosaceae** – *Prunus*, *Malus*, *Pyrus*, etc.
- **Ulmaceae** – *Ulmus*, *Celtis*, *Zelkova*
- **Crataegus** – Some species unlobed
- **Tilia**
- **Ilex**
ISA Exam Tree ID

- 10 multiple (4) choice questions
- Photos
- Requires ID to species
- Common & Latin names given
- Regionalized selections
References

• USU Extension Forestry – [extension.usu.edu/forestry](extension.usu.edu/forestry)
• USU Tree Browser – [www.treebrowser.org](www.treebrowser.org)
• Guide to the Trees of Utah and the Intermountain West – USU Press (Amazon, Borders, local bookstores, etc.)
• Dendrology at Virginia Tech – [www.cnr.vt.edu/dendro](www.cnr.vt.edu/dendro)
• USDA Plants Database – [plants.usda.gov](plants.usda.gov)